OPERATING INSTRUCTIONS

IOLG2PN-03208R01 – PROFINET

IO-Link Master

EN

SICK
Sensor Intelligence.

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1 General information

1.1 Information on the operating instructions

These operating instructions supplement the supplied Quickstart guide and include additional information and more detailed descriptions of working with the IOLG2PN-03208R01 PROFINET IO-Link Master.

These operating instructions are intended for qualified personnel and electrical specialists and must be read before starting any work.

1.2 Explanation of symbols

Physical damage

Warnings in these operating instructions are labeled with symbols.

These warnings must be observed at all times and care must be taken to avoid physical damage.

ATTENTION!

... indicates a possible hazardous situation which may lead to physical damage if it is not avoided.

Tips and recommendations

NOTE!

... highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

1.3 Abbreviations

Abbreviation	Description
PNT	PROFINET
EMC	Electromagnetic compatibility
FE	Functional grounding
E	Input
A	Output

Table 1: Abbreviations

1.4 Limitation of liability

Applicable standards and regulations, the latest state of technological development, and many years of knowledge and experience have all been taken into account when assembling the data and information contained in these operating instructions.

The manufacturer accepts no liability for damage caused by:

- Failing to observe the operating instructions
- Incorrect use
- Use by untrained personnel
- Opening the housing
- Unauthorized conversions
- Technical modifications
- Use of defective devices
- Use of unauthorized spare parts/consumable parts.

With special variants, where optional extras have been ordered, or owing to the latest technical changes, the actual scope of delivery may vary from the features and illustrations shown here.

1.5 Scope of delivery

Included with delivery:

- IO-Link Master PROFINET IOLG2PN-03208R01
- 4 M12 blind plugs for sealing unused IO-Link ports
- M4 ground strap with M4 x 6 screw
- 20 labels

Supplied documentation:

- Quickstart

1.6 Customer service

If you require any technical information, our customer service department will be happy to help.

See the back page for your representative office.

NOTE!

In order to allow us to deal with the matter quickly, please note down the type designation and order number before calling. This information can be found on the side of the IO-Link Master.

1.7 EU Declaration of Conformity

→ You can download the EU declaration of conformity via the Internet from “www.sick.com”.

2 Safety

2.1 Correct Use

The IOLG2PN-03208R01 IO-Link Master is a remote IO-Link input and output module for integration into a PROFINET network.

The IOLG2PN-03208R01 IO-Link Master may only be used in applications in which the safety of personnel does **not** depend on the device function.

SICK AG assumes no liability for losses or damage arising from the use of the product, either directly or indirectly. This applies in particular to use of the product that does not conform to its intended purpose and is neither described nor mentioned in this documentation.

2.2 Incorrect Use

The IOLG2PN-03208R01 IO-Link Master must not be used in explosive environments.

Any other use that is not described as a correct use is prohibited.

No accessories may be connected which have not been explicitly stipulated, in terms of quantity and properties, and approved by SICK AG.

2.3 Requirements for qualified personnel

ATTENTION!

Damage to the device in the event of improper handling!

Improper handling may lead to physical damage.

For this reason:

- All work must only ever be carried out by the stipulated persons.

The operating instructions state the following qualification requirements for the various areas of work:

- **Qualified personnel**
  are able to carry out the work assigned to them and independently recognize potential risks due to their specialist training, knowledge, and experience, as well as knowledge of the relevant regulations.
- **Electrical specialists**
  are able to carry out work on electrical systems and independently recognize potential risks due to their specialist training, knowledge, and experience, as well as knowledge of the relevant standards and regulations.
  In Germany, electrical specialists must meet the specifications of the work safety regulation BGV A3 (e.g., master electrician). Other relevant regulations applicable in other countries must be observed.

3 Setup and function

3.1 Setup

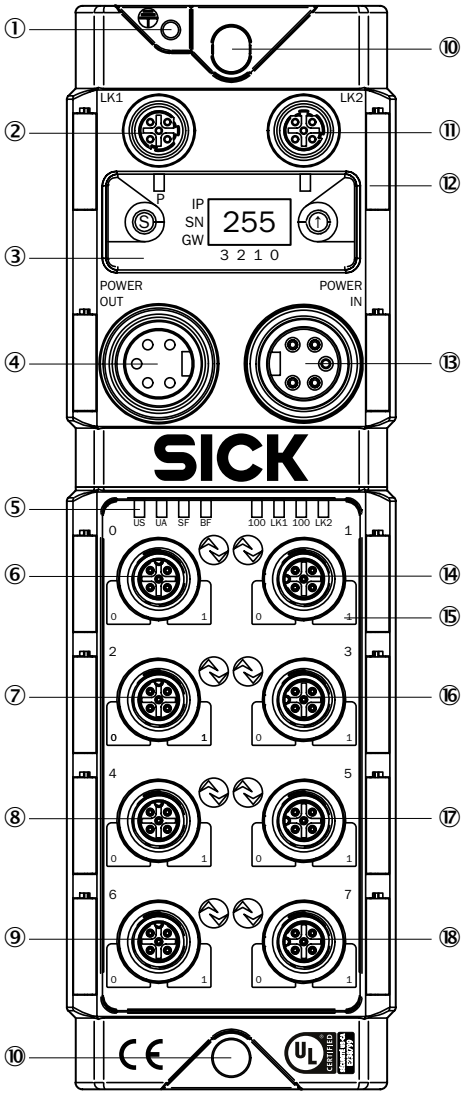


Fig. 1: Setup of IO-Link Master PROFINET IOLG2PN-03208R01

① *Functional ground connection*
② *PROFINET-Port 1 (IN)*
③ *Display with operating buttons and two display LEDs*
④ *Output supply voltage*
⑤ *Status LED: IO-Link Master / PROFINET communication*
⑥ *Port 0 (IO-Link, Standard I/O)*
⑦ *Port 2 (IO-Link, Standard I/O)*
⑧ *Port 4 (IO-Link, Standard I/O)*
⑨ *Port 6 (IO-Link, Standard I/O)*
⑩ *Mounting hole*
⑪ *PROFINET Port 2 (OUT)*
⑫ *Label*
⑬ *Input supply voltage*
⑭ *Port 1 (IO-Link, Standard I/O)*
⑮ *Pin/port LEDs: Signal status*
⑯ *Port 3 (IO-Link, Standard I/O)*
⑰ *Port 5 (IO-Link, Standard I/O)*
⑱ *Port 7 (IO-Link, Standard I/O)*

3.2 Function

The IOLG2PN-03208R01 IO-Link Master is a remote IO-Link input and output module for integration into a PROFINET network.

The eight ports can be configured and used independently of one another. They can either be configured as IO-Link ports or standard I/O ports.

3.3 Status indicators and operating elements

Overview

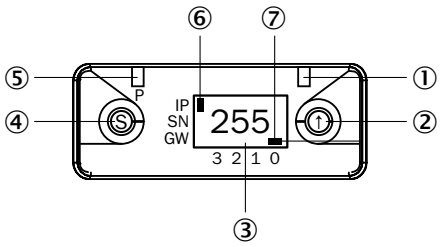


Fig. 2: Status indicators and operating buttons

① *Display LED (configurable)*
② *Arrow button*
③ *Indicator*
④ *Set button*
⑤ *Display LED (configurable)*
⑥ *Cursor for selecting the address type*
⑦ *Cursor for selecting the octet*

IP IP address
SN Subnet address
GW Gateway address
0 Fourth octet
1 Third octet
2 Second octet
3 First octet

Function indicators (LEDs)

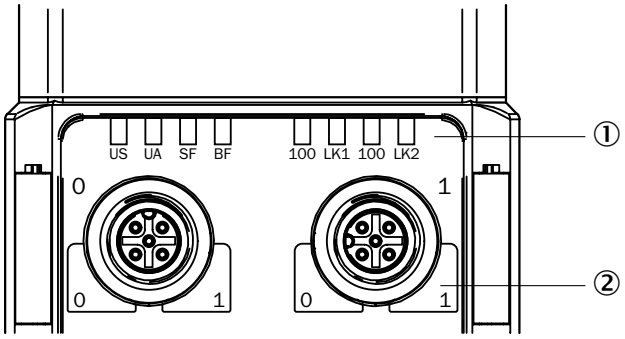


Fig. 3: Function indicators (LEDs)

① *Status LEDs: IO-Link Master / PROFINET communication*
② *Pin/port LEDs: Signal status*

Pin/port LEDs: Pin 2 and pin 4 assignment

Port configured as	Right LED	Left LED
IO-Link port	Pin 4 signal status	Pin 2 signal status
Standard I/O port	Pin 2 signal status	Pin 4 signal status

Table 2: Pin/port LEDs: Assignment

Status LEDs: IO-Link Master

Function indicator	Description
US	• LED lights up green: Input voltage OK. • LED flashes red: Input voltage low (< 18 V)
UA	• LED lights up green: Output voltage OK. • LED flashes red: Output voltage low (< 18 V) • LED lights up read: No output voltage or voltage < 11 V
SF	• LED off: No error • LED red: Error – Watchdog Timeout – Channel, general or extended diagnostics present – System error • LED flashes red: Service DCP signal started via bus
BF	• LED off: No error • LED red: Low speed of the physical link or no physical link • LED flashes red: No data exchange or no configuration

Table 3: Status LEDs: IO-Link Master

Status LEDs: PROFINET communication

Function indicator	Description
100	• LED off: Transfer rate 10 Mbit/s • LED lights up yellow: Transfer rate 100 Mbit/s
LK1 and LK2	• LED green: Data transfer

Table 4: Status LEDs: PROFINET communication

Pin/port LEDs: Standard I/O port

Indicator LEDs	Description
Off	The status of the relevant input or output pin is “0”.
Yellow	The status of the relevant input or output pin is “1”.
Flashing red	Short-circuit in sensor supply between pin 1 and pin 3
Red	• Short-circuit on relevant output, either between pin 2 and pin 3 and/or between pin 4 and pin 3 • No high signal on the diagnostic input

Table 5: Pin/port LEDs: Standard I/O port

Pin/port LEDs: IO-Link port

Indicator LEDs	Description
Green	IO-Link connection active
Flashing green	No IO-Link connection or incorrect IO-Link device
Green, fast flashing	IO-Link preoperate during data storage
Red, fast flashing	• Validation failed • Incorrect configuration of IO-Link data length • Data storage failed • Incorrect IO-Link device for data storage
Red	IO-Link short-circuit between pin 3 and pin 4

Table 6: Pin/port LEDs: IO-Link port

4 Mounting

4.1 Mounting the IO-Link Master

➢ Mount the IO-Link Master using the 2 mounting holes with M6 screws and washers.

5 Electrical connection

5.1 Safety

Electromagnetic fault

ATTENTION!

Electromagnetic fault!

Electromagnetic interference can cause the device, system, or nearby devices to malfunction! The IO-Link Master meets the requirements of Class A (industrial applications). Operation in other electromagnetic environments may cause faults or malfunctions.

- The operator must take appropriate precautions.
- Only connect the IO-Link Master to approved supply voltage.
- Only use approved cables.

Working with live parts

ATTENTION!

Equipment damage due to working with live parts!

Working with live parts may result in damage to the equipment.

- Only connect and disconnect cable connections when the power is off.

Incorrect supply voltage

ATTENTION!

Equipment damage due to incorrect supply voltage!

An incorrect supply voltage may result in damage to the equipment.

- Protect the supply voltage with max. 8 A fuses.

Excessive current load

ATTENTION!

Equipment damage due to excessive current load!

An excessive current load may result in damage to the equipment.

- Do not exceed the maximum permissible total current of 8 A for the IO-Link Master.
- Each output provides a maximum current of 2 A.
- The sensors/bus and the actuator should be powered via separate current sources if possible.

Incorrect grounding

ATTENTION!

Incorrect grounding!

An incorrect grounding may result in equipment damage or malfunction.

- The grounding between the IO-Link Master and the machine must be a low-impedance system.
- The ground connection must be as short as possible.

5.2 IO-Link Master electrical connection

1. Ensure power supply is not connected.
2. Connect the IO-Link Master to the functional grounding of the system using the supplied ground strap. See the figure below.
3. Connect supply voltage to “POWER IN” using a suitable cable.
4. Make fieldbus connection via PROFINET port 1/PROFINET port 2.
5. Connect IO-Link devices or standard devices to the IO-Link ports.
6. If provided, connect the next gateway to “POWER OUT”.

Functional grounding

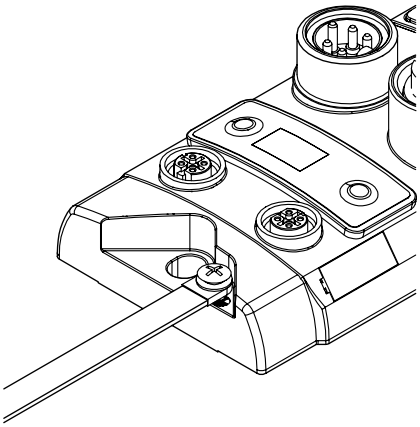


Fig. 4: Ground connection

7. IO-Link ports that are not in use must be sealed with M12 blind plugs to ensure the enclosure rating of IP 67.

NOTE!

Four M12 blind plugs are included in the scope of delivery.

5.3 Connection diagrams

5.3.1 Connection diagram for “POWER IN” and “POWER OUT” supply voltage

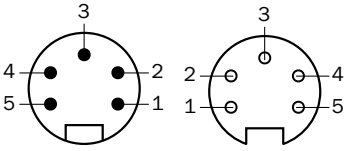


Fig. 5: Supply voltage
Right: POWER IN 7/8” male connector, 5-pin
Right: POWER OUT 7/8” female connector, 5-pin

Contact	Signal	Description
1	0 V	Actuator supply ground
2	0 V	IO-Link Master and/or sensor supply ground
3	FE	Functional grounding
4	DC 24 V	IO-Link Master and/or sensor supply
5	DC 24 V	Actuator supply

Table 7: Description of “POWER IN” and “POWER OUT” supply voltage

5.3.2 “PROFINET” connection diagram

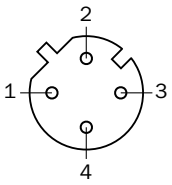


Fig. 6: PROFINET connection diagram, M12 female connector, D-coded, 4-pin

Contact	Signal	Description
1	Tx+	Transmitter+
2	Rx+	Receiver+
3	Tx–	Transmitter–
4	Rx–	Receiver–

Table 8: PROFINET description, M12 female connector, D-coded, 4-pin

5.3.3 “IO-Link port” connection diagram

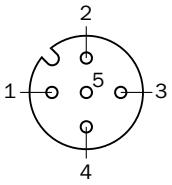


Fig. 7: IO-Link port connection diagram, M12 female connector, A-coded, 5-pin

Port used as I/O port

Contact	Signal	Description
1	L+	DC 24 V, 2 A
2	I/O	Input or output (max. 2 A)
3	M	GND
4	I/O	Input or output (max. 2 A)
5	FE	Functional grounding

Table 9: I/O port description, M12 female connector, A-coded, 5-pin

Port used as IO-Link port

Contact	Signal	Description
1	L+	DC 24 V, 1.6 A
2	I/O	Input or output
3	M	GND
4	IO-Link	IO-Link, input or output
5	Not connected	Not connected

Table 10: IO-Link port description, M12 female connector, A-coded, 5-pin

For the digital sensor inputs, see EN 61131-2, type 2.

6 System integration and configuration

The system integration and the configuration are an example of the connection of the IO-Link Master with the SIEMENS “TIA Portal V13” project planning software.

When using other controllers and project planning software, refer to the relevant documentation.

GSDML file (Generic Station Description Markup Language)

The device data required for project planning are saved in GSDML files. The GSDML file makes the possible data module available with input or output of different data widths.

You can download the GSDML files via the Internet page “www.sick.com”.

Top module and data modules

PROFINET devices are designed as a modular system. The system is composed of a top module and several data modules.

To configure the IO-Link Master the relevant data modules are assigned to a slot. The project planning software represents the data modules broken down according to the slots.

Integrating the IO-Link Master

You can search for devices using the hardware catalog and move to the PROFINET string using Drag & Drop.

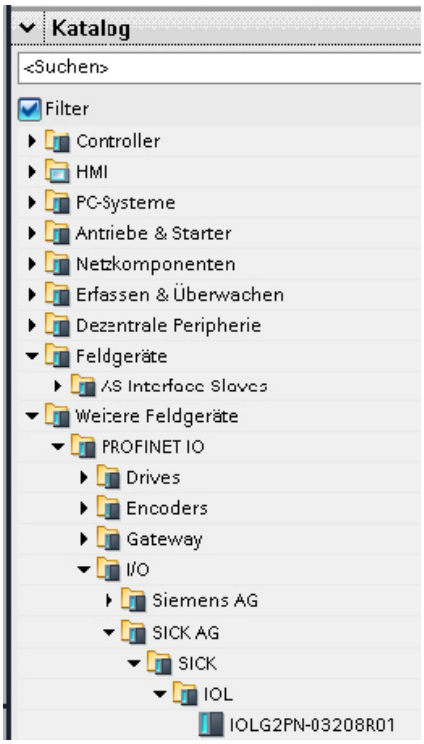


Fig. 8: Hardware catalog

Integrating modules

The IO-Link Master IOLG2PN-03208R01 is used for PROFINET communication. In X1 PN-IO you can select functions, for example “Prioritized startup” or “Domain ring topology”.

Overview of assignment of slots and modules

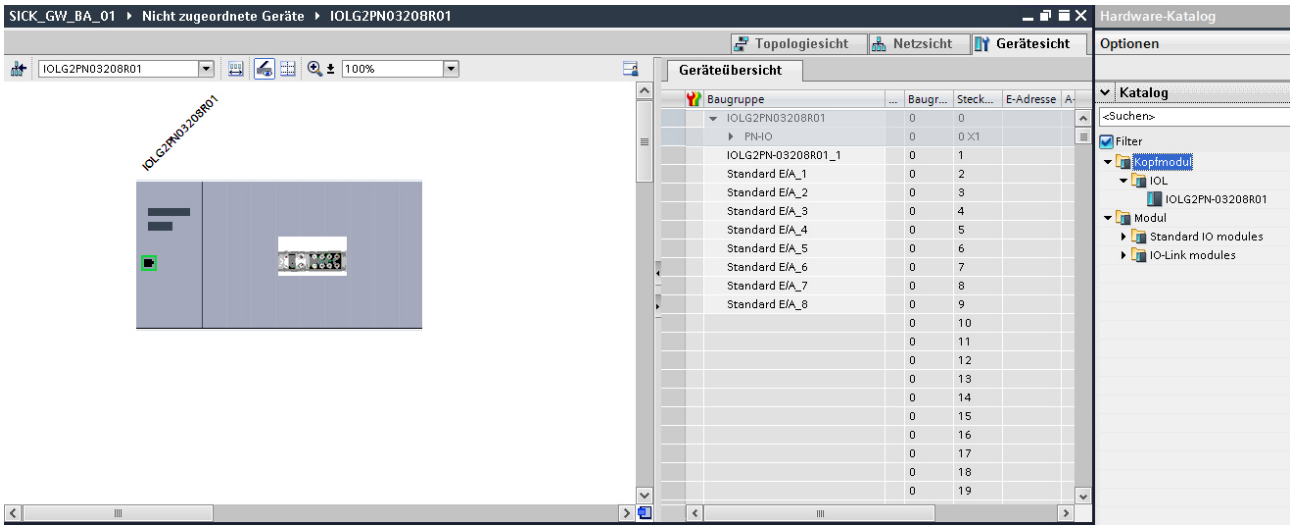
The slots are assigned the following modules at the factory. Slots 2 to 9 are assigned to standard I/O modules.

Slot	Description
1	Top module: Define port functions “input”, “output”, “diagnostic input” or “IO-Link” or diagnostic messages.
2	IO-Link module or standard I/O module for port 0
3	IO-Link module or standard I/O module for port 1
4	IO-Link module or standard I/O module for port 2
5	IO-Link module or standard I/O module for port 3
6	IO-Link module or standard I/O module for port 4
7	IO-Link module or standard I/O module for port 5
8	IO-Link module or standard I/O module for port 6
9	IO-Link module or standard I/O module for port 7

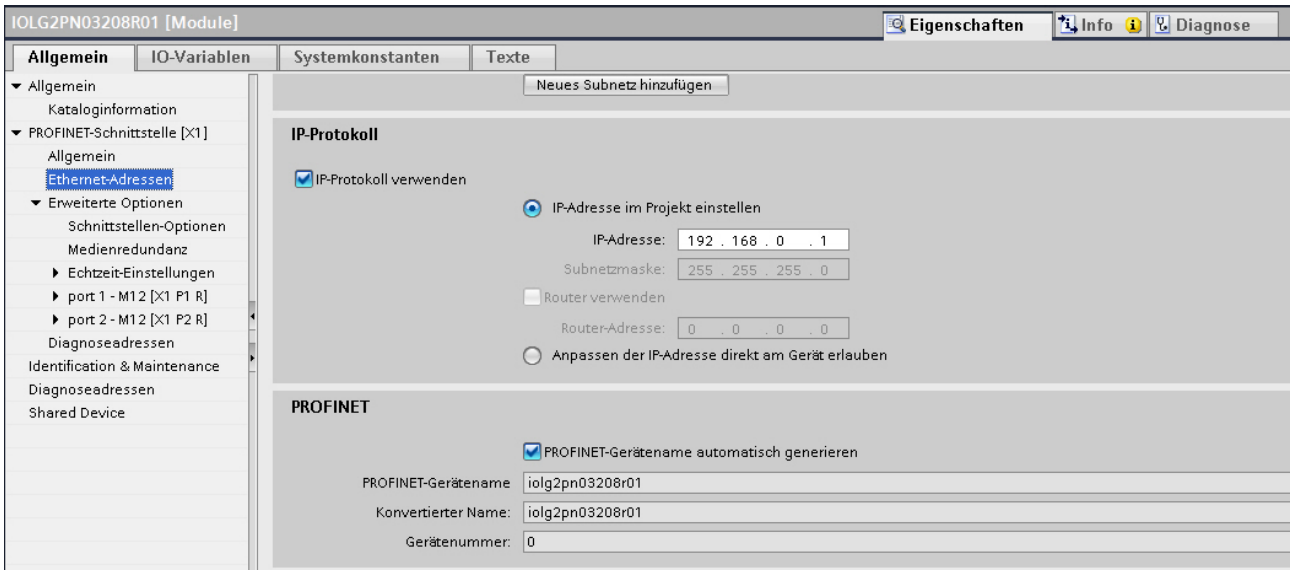
Table 11: Overview of assignment of slots and modules

Device name, PROFINET address

The communication parameters of the IO-Link Master are displayed by double-clicking on IO-Link Master in the “Device overview” window.



Configure here the device names and PROFINET address (IP).

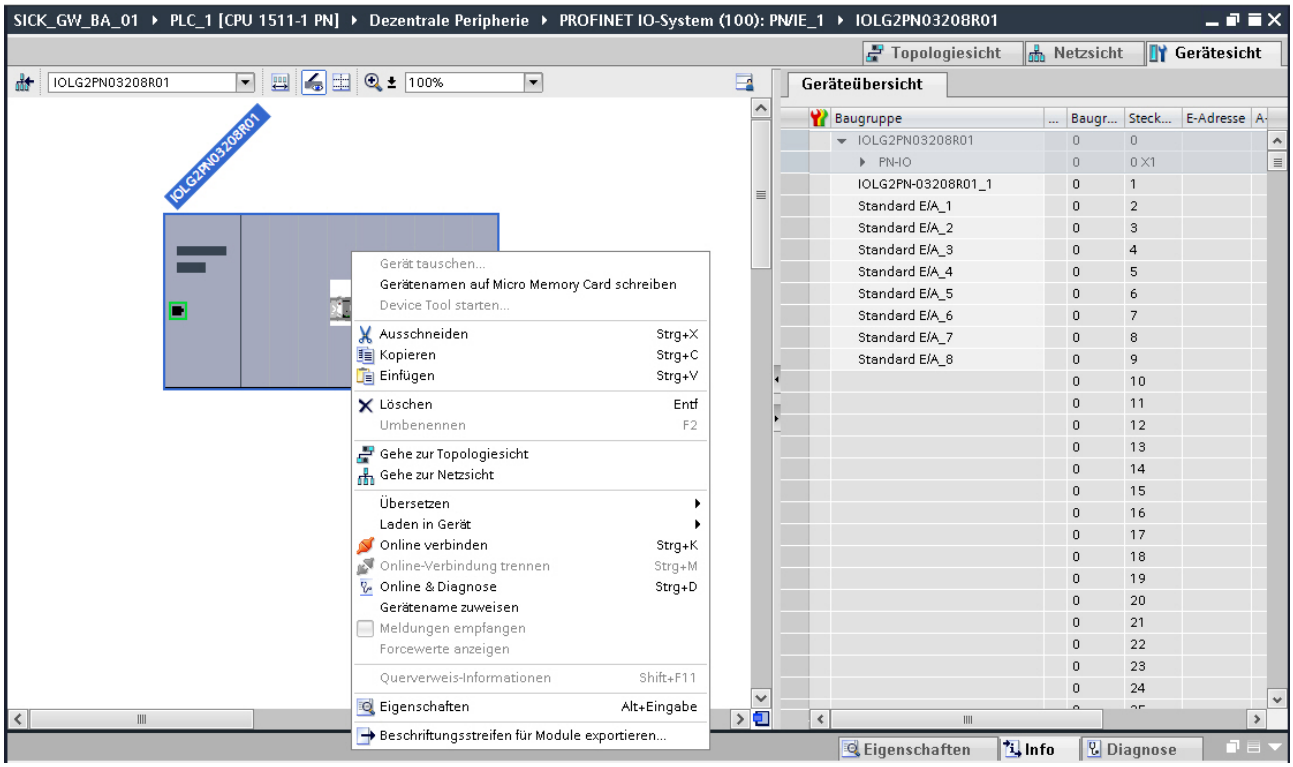


Setting up device relationships

Click the right mouse button on the selected module.

Press Assign device names.

The tool starts with which you can assign a device name to a module.



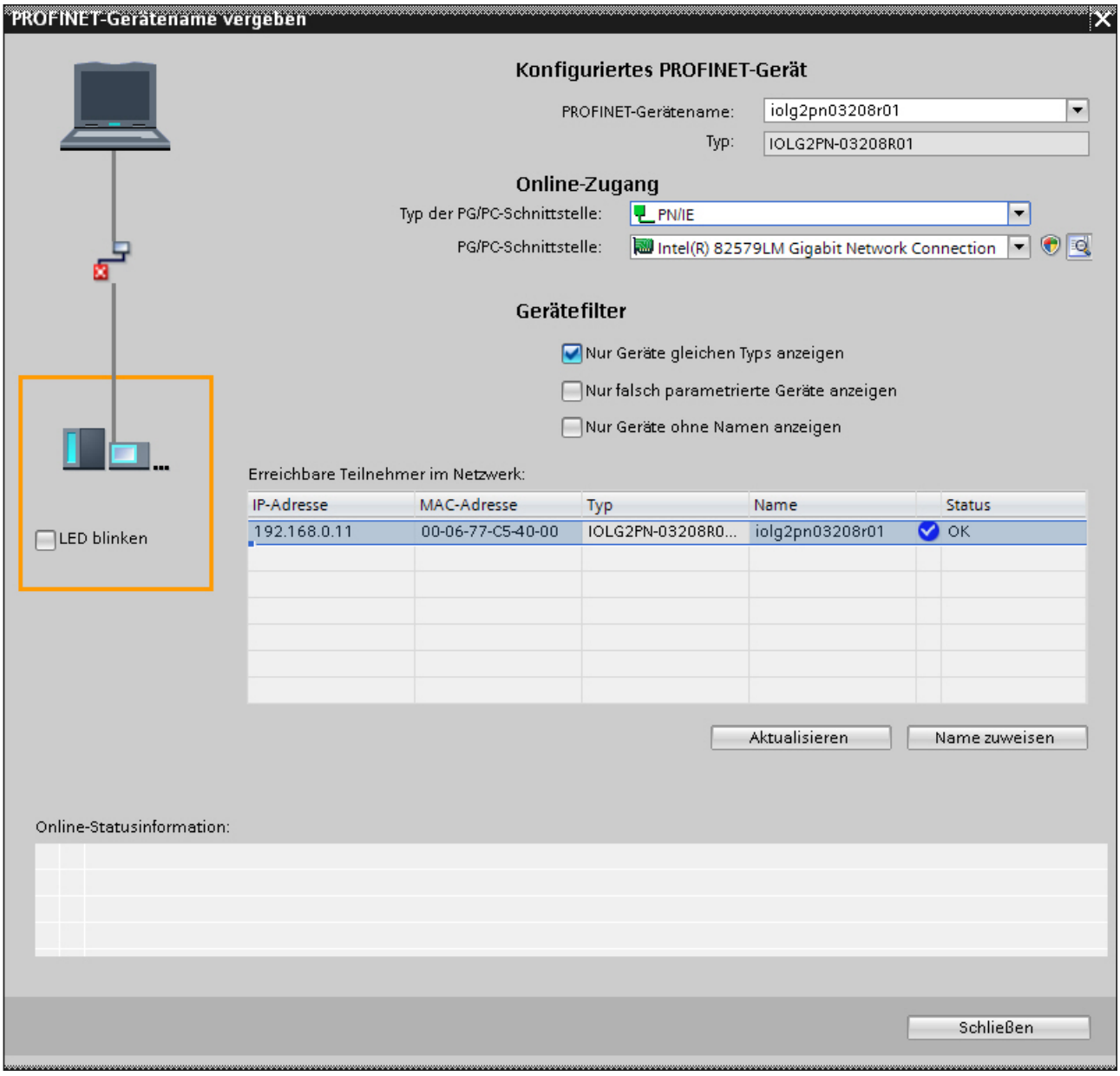
Allocating device names

Select the desired device names.

Assign the device name to the marked and found device using the command “Assign name”.

The device name must be identical to the names previously configured under “Properties”. See Page 21.

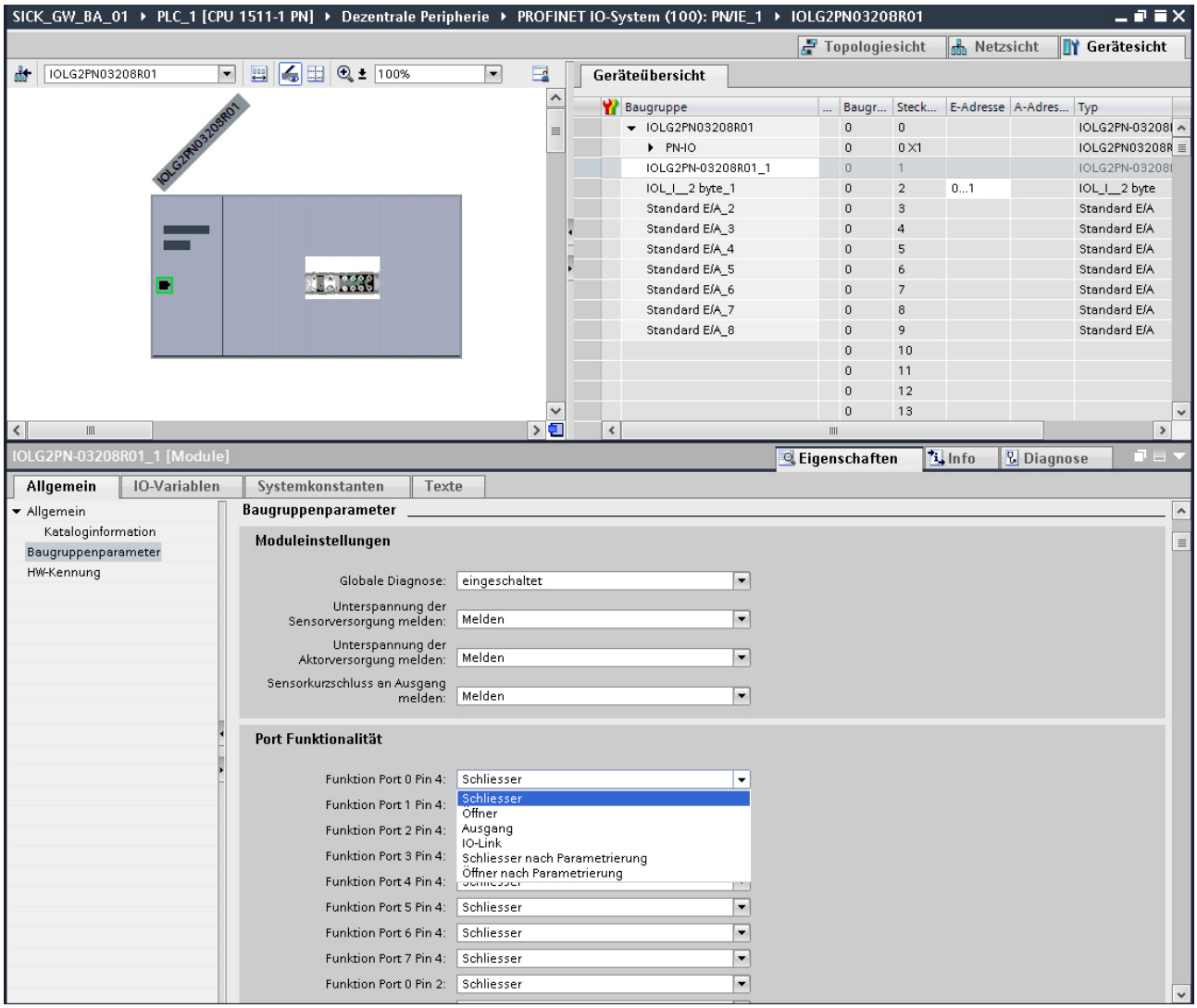
The identification is done via the MAC address or via the flash test. For the MAC address refer to the type label on the back of the IO-Link Master.



Configure top module

Select top module in the “Device overview” tab.

Define the port functions and diagnostic functions using the “Assembly parameters” menu item.



NOTE!

Configuring port as IO-Link port: For each desired IO-Link port you must configure pin 4 for IO-Link. If the connected IO-Link device has outputs available, you must configure pin 2 of the corresponding port as an output.

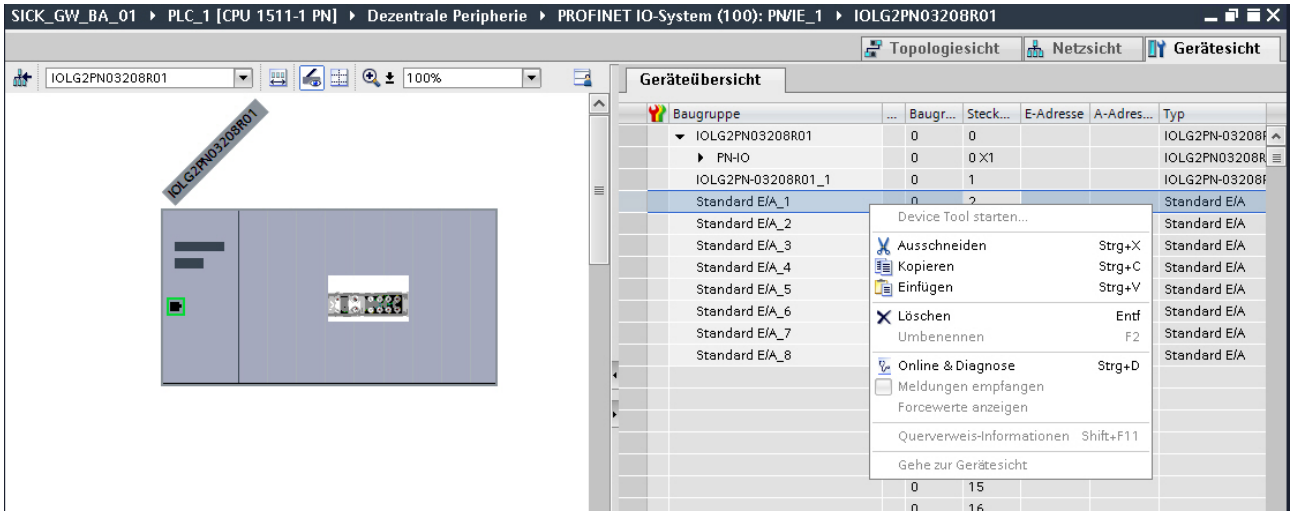
Configuring port as standard I/O port: For each port you can assign pin 4 and pin 2 the function “normally closed” or “normally open”. The function “Diagnostic input” is additionally available for pin 2.

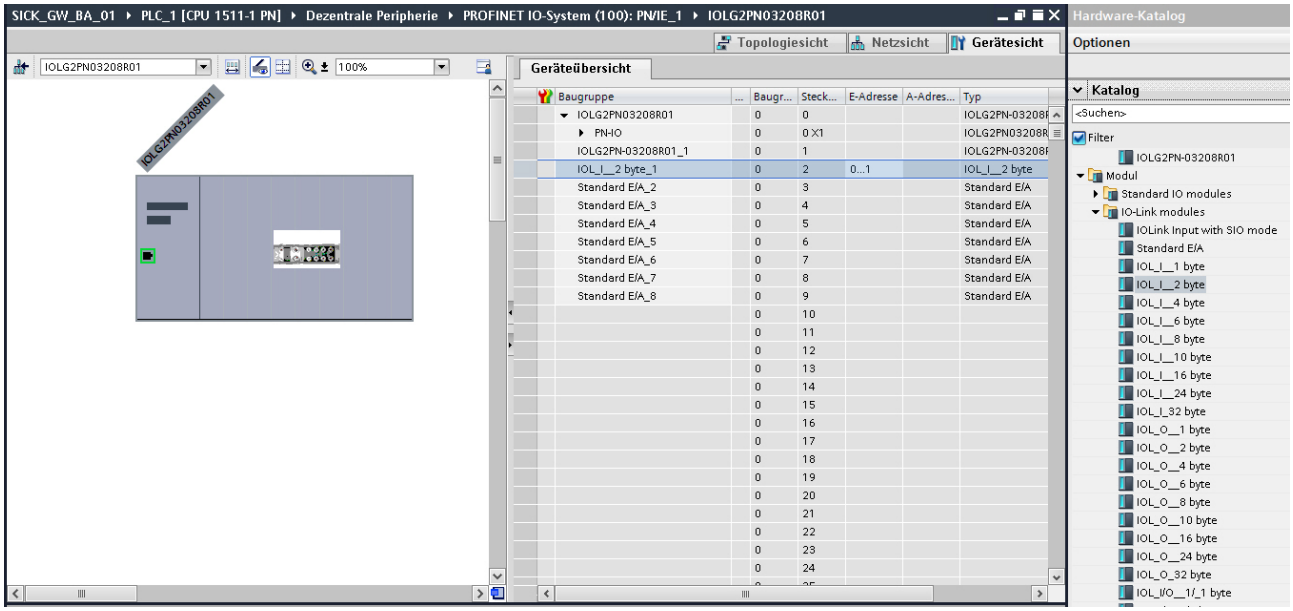
Configuration

The IO-Link modules and the standard I/O modules must be configured consistent with the configurations of the top module.

If needed these can be moved from the hardware catalog using Drag & Drop in the configuration table. All ports are configured as standard I/O ports at the factory.

If you want to configure the port as a IO-Link port, you must delete the module and replace with an IO-Link module.





Addressing modules

By selecting the IO-Link modules you can select I/O addresses in the menu tree and thus change the addresses.

Configuring IO-Link modules

Corresponding to the process data length of the IO-Link device you must select a matching IO-Link module in the catalog and move it to the corresponding slot per Drag & Drop.

Refer to the documentation for the IO-Link device for the required process data lengths of the IO-Link device.

Configuring standard input/output

If one of the possible port pins (pin 4) should be configured with a standard function (input, output), you must use the place holder module “Standard I/O” for the corresponding slot.

To address the inputs and outputs the modules “input pin 2”, “input pin 4”, “output pin 2” and “output pin 4” must be moved from the catalog in the configuration.

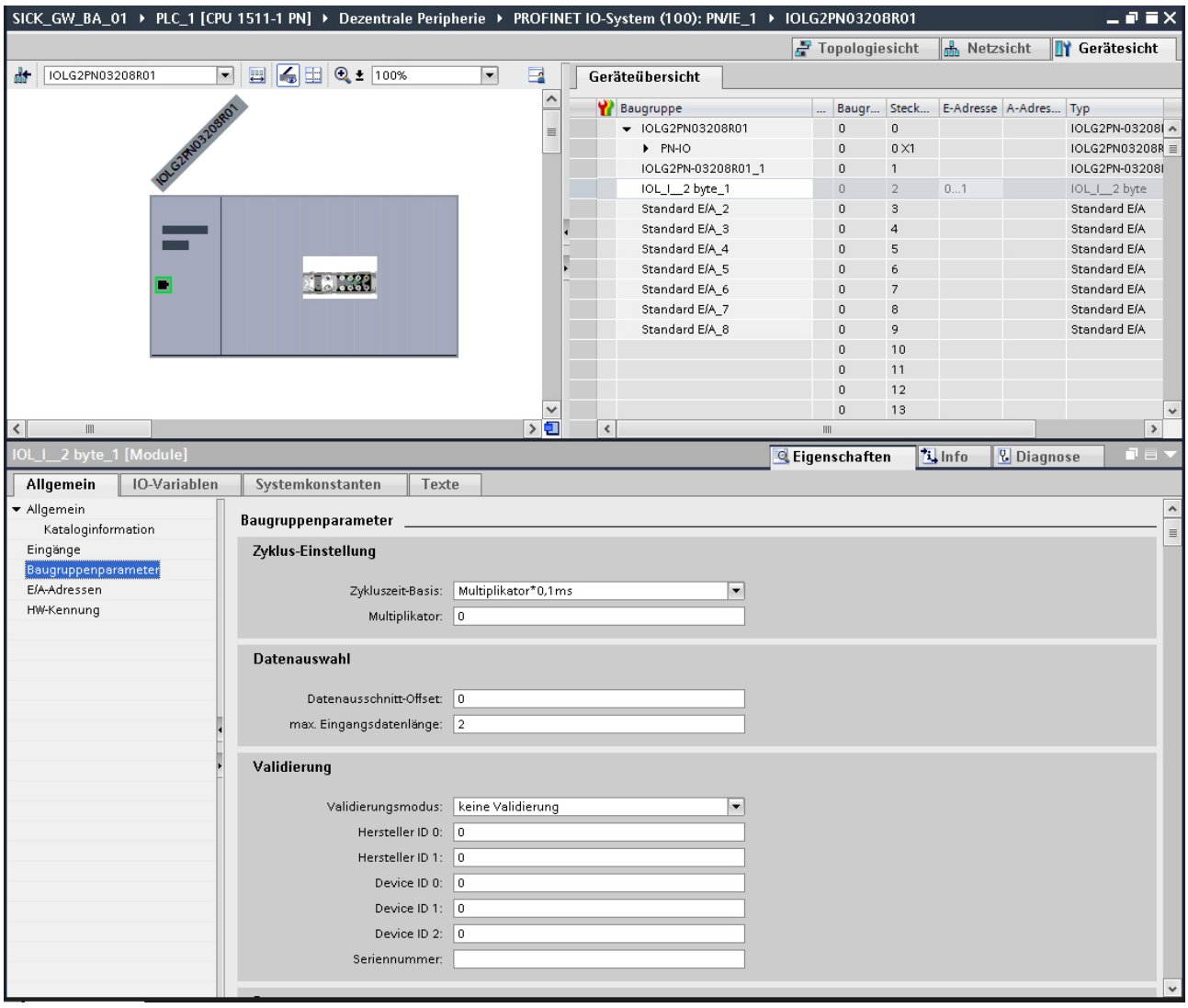
For the SIO function you must integrate the “IO-Link input with SIO mode” module.

Various functions are mapped with the remaining modules in the respective process data areas.

For more information, see Page 26, Chapter 6.1 and Page 27, Chapter 6.2.

During the selection of the IO-Link module you can change the IO-Link parameter of the respective port/pin using the “Assembly parameters” menu item.

For more information, see Page 26, Chapter 6.1 and Page 27, Chapter 6.2.



Ending configuration

Download the configuration in the hardware configuration.

If a bus error is still displayed on the module, the possible causes are possible:

- Line break (no IO-Link device connected)
- IO-Link device error, e.g., external supply voltage not connected
- Validation failed
- Device relationship not established.
  Select the heading “Accessible nodes” via the “Online” tab. The network is scanned and checked whether the device responds under the correct device name and under the correct IP address.
  If necessary adapt the Ethernet address or the device name. Assign the device name to the device again and download the configuration.
- IO-Link is configured in the top module, however the slot module is missing or is integrated at the wrong location.
- The IO-Link module is in the correct slot, however pin 4 for the IO-Link port as not configured via the top module for IO-Link.

6.1 Configuring module properties

Assembly parameter “Module settings”

- Global diagnostics: With this function all diagnostic messages of the module can be allowed or suppressed. Optical diagnostic signals and diagnostics in configured diagnosis modules are not affected.
- Undervoltage of the sensor supply: With this function the diagnostics message “Undervoltage sensor supply” of the module is allowed or suppressed. Optical diagnoses and diagnostics in configured diagnosis modules are not affected.
- Undervoltage of the actuator supply: With this function the diagnostics message “Undervoltage actuator supply” of the module is allowed or suppressed. Optical diagnostic signals and diagnostics in configured diagnosis modules are not affected.

Assembly parameter “Port functionality”

Here you define the function for each individual port/pin:

Option	Description
Normally open	Input as N/O contact
Normally closed	Input as N/C contact
Output	Output function
IO-Link	IO-Link function
Normally open after configuration	An IO-Link device can be configured via IO-Link and then set in an SIO module, in which the IO-Link port/pin functions as a simple switch input.
Normally closed after configuration	An IO-Link device can be configured via IO-Link and then set in an SIO module, in which the IO-Link port/pin functions as a simple normally closed input.

Table 12: Port functionality

Safe state

This function is an extension of an output configuration of the relevant port pin. For each port pin, you can define a safe state which should be assumed if bus communication is lost.

6.2 Bit mapping and function of the modules

IO-Link modules scheme

IO-Link modules are structured according to the following scheme:

- IOL_I/O_x/xBytes

	Description
I/O	• I: Input data • O: Output data • I/O: Input and output data
x/xBytes	Amount of process data used. The amount should be equal to or greater than the process data length of the IO-Link device.

Table 13: IO-Link module scheme

Standard I/O modules

If a port is configured as a standard I/O, first you must move one of the modules “Input pin 2”, “Input pin 4”, “Output pin 2 and ”output pin 4” from the catalog into the configuration. The process data of the individual ports are mapped in this module.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Short-circuit pin 2 or short circuit pin 4

This module indicates that there is a short-circuit between a set output and ground on a port.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Actuator warning pin 2 or actuator warning pin 4

This module indicates if a voltage is supplied on a non set output.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Restart pin 2 or restart pin 4

This module enables you to configure the startup behavior after an actuator short-circuit.

- Bit set: Automatic restart
- Bit not set: No automatic restart; restart must be triggered manually.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

IO-Link diagnostic settings

The IO-Link diagnosis for the respective port is activated or deactivated via this module. The diagnosis data can be read out via PLC/fieldbus only if the diagnosis is set.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

IO-Link communication

Bit status for each IO-Link port, feedback whether a communication is established.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Female connector peripheral error

This module indicates whether an error has occurred on a port.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Short-circuit sensor supply

This module indicates whether there is a short-circuit in the sensor supply on a port.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Station diagnostic

This module indicates which error has occurred.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IO-Link short-circuit	Actuator warning	Actuator short-circuit	Sensor voltage short-circuit	External error	res.	US actuator	US sensor

Display LED

This module enables you to control the display LEDs.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
						Green LED	Red LED

Assembly parameter “Cycle settings”

The speed of the IO-Link communication is affected by this parameter. The IO-Link cycle time is calculated with the variables “Basic cycle time” and “Multiplier”. The time is selected using the “Basic cycle time” field. Input between 0 to 63 (decimal) for the “Multiplier”.

Assembly parameter “Data selection”

These settings only apply to the input data.

Establish the start byte of the process data with the field “Data segment offset”. Input the actual process data length of the IO-Link device in the field “Max. input data length”.

Using an IO-Link module with corresponding process data length you can adapt the visible data window to the input data.

Assembly parameter “Validation”

The following options are available for validation:

Option	Description
No validation	Validation is deactivated. Every IO-Link device is accepted.
Compatibility (VID + DID)	Vendor ID and device ID are compared with the module data. IO-Link communication only starts if they match. Vendor ID and Device ID are input in decimals.
Identity (VID + DID + SN)	Vendor ID, device ID, and serial number are compared with the module data. IO-Link communication only starts if they match. Vendor ID and Device ID are input in “decimals”, the serial number is input in “visible string”.

Table 14: Validation

Example

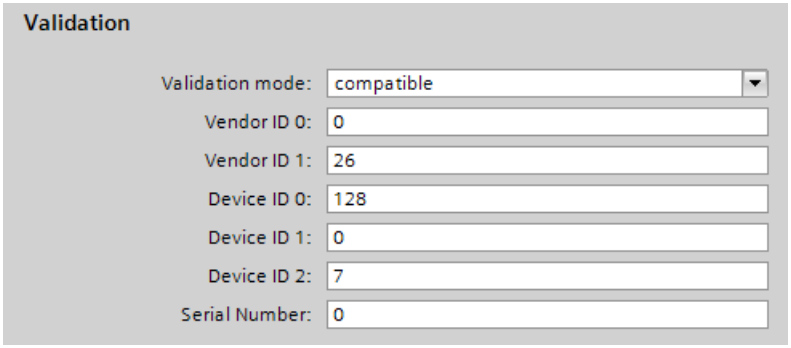


Fig. 9: Validation example

- VID = 26 (SICK AG)
- DID = 8388615 (0x800007)

- VID: 0
- VID1: 26

- DID0: 128 (0x28)
- DID1: 0 (0x00)
- DID2: 7 (0x07)

Parameter server

The following options are available for the parameter server:

Option	Description
Switched on	Data storage function is active. Parameter and identification data for the IO-Link device is saved retentively.
Switched off	Data storage function is deactivated. The saved data are retained.
Deleted	Data storage function is deactivated. The saved data is deleted.
Enable of block upload	Enable or block the parameter data upload into the IO-Link Master port data storage. • Enable upload: The IO-Link Master starts to upload the parameter data as soon as an IO-Link device requests an upload (upload flag set) or if there is no data stored in the master port, e.g., after the data has been deleted or before the first data upload • Block upload: If the upload is blocked, the data is not uploaded. If an IO-Link device sends an upload request, a download starts if there are different parameter sets since an upload cannot take place. The download must be enabled.
Enable or block download	Enable or block the parameter data download to the IO-Link device. • Enable download: As soon as the saved parameter data in the parameter server of the port differs from a connected IO-Link device and there is no upload request from the IO-Link device, a download is performed. • Block download: If the download is blocked, the parameter data is uploaded if it is activated. The upload flag for the IO-Link device does not need to be set in this case. The upload must be enabled.
Block upload and download	If both upload and download are blocked, the parameter data is not exchanged. However, the IO-Link device still communicates with the IO-Link port.

Table 15: Parameter server

NOTE!

After the parameter data upload, the vendor ID and device ID are retained until the data sets of the connected IO-Link device are deleted.

A validation takes place when the connected IO-Link device starts up. This means that only one IO-Link device of the same type can be used for data storage. In order to use an IO-Link device of a different type, you must delete the content of the parameter server.

7 Diagnostics

7.1 Diagnostic messages

The diagnostic message that the IO-Link Master generates with an error, is usually read out and processed by the PLC. It is also possible to read out and evaluate the diagnostics using function modules from the IO-Link Master.
The diagnostic message is 34 bytes long and divided into 3 blocks: BlockHeader, AlarmSpecifier and ChannelProperties

Byte	Value	Designation	Block
0	00	Block Type	BlockHeader
1	02		
2	00	Block Length	
3	1E		
4	01	Block Version High	
5	00	Block Version Low	
6	00	Alarm type	
7	01		
8	00	API	
9	00		
10	00		
11	00		
12	00	Slot number	
13	01		
14	00	Subslot number	
15	01		
16	00	Module ID	
17	00		
18	00		
19	17		
20	00	Submodule ID	
21	00		
22	00		
23	01		
24	A8	Alarm Specifier	AlarmSpecifier
25	36		
26	80	User Structure ID	
27	00		
28	00	Channel number	
29	08		
30	08	Channel Properties	ChannelProperties
31	00		
32	00	Channel Error Type	
33	1A		

Table 16: Diagnostic messages

7.2 BlockHeader

The “BlockHeader” is the first part of the diagnostic and is 24 bytes long.

Designation	Byte	Description	Possible values	Description
Block Type	0 – 1	2 bytes, Data type definition	0x0002	Alarm Notification Low
Block Length	2 – 3	2 bytes of data, which describe the length of the following diagnostic message. For the complete diagnostic message add the 2 bytes from “Block type” and the 2 bytes from “Block length”.	–	–
Block Version High	4	1 byte, preset to 0x01	–	–
Block Version Low	5	1 byte, preset to 0x00	–	–
Alarm Type	6 – 7	2 bytes, here is the information on which “Alarm type” it is	0x0001	Diagnostics
API	8 – 11	4 bytes, Default = 0	0x00000000	Default value
Slot	12 – 13	2 bytes, describes which slot of the module reports an error.	0x0001	Slot 1
Subslot	14 – 15	2 bytes, describes which subslot of the slot reports an error	0x0001	Subslot 1
Module ID	16 – 19	4 bytes, describes which module is inserted in the respective slot. “Module ID” is stored in the GSDML.	0x00000017	IOLG2PN-03208R01 (header module)
Submodule ID	20 – 23	4 bytes, describes which submodule is used with the respective module. “Submodule ID” is stored in the GSDML.	0x00000001	IOLG2PN-03208R01 (header module)

Table 17: BlockHeader

7.3 AlarmSpecifier

The “AlarmSpecifier” contains 2 bytes (24 and 25), which are made up as follows:

Designation	Bit	Description	Possible values	Description
Sequence Number	0 – 10	This counter is incremented with every new diagnostic message.	–	–
Channel Diagnostic	11	Channel specific diagnostics	0x00	No channel specific diagnostics present
			0x01	Channel specific diagnostics present
Manufacturer Specific Diagnosis	12	Manufacturer specific diagnosis	0x00	No manufacturer specific diagnostics present
			0x01	Manufacturer specific diagnostics present

Designation	Bit	Description	Possible values	Description
Submodule Diagnostic State	13	Submodule diagnostics	0x00	No other submodule diagnostics present
			0x01	At least one other diagnostic of the submodule available
Reserved	14	–	–	–
AR Diagnostic State	15	Module diagnostics	0x00	No further diagnostics of the module available
			0x01	At least one other diagnostic of the module available
User Structure Ident		2 bytes, describes the type of diagnostics	0x8000	Channel specific diagnostics

Table 18: AlarmSpecifier

Channel Number

2 bytes of data, which describe where the error occurred on the module.

Possible values		
Bit	**Value**	**Position**
0 to 3	0x00	Port 0 Pin 4
	0x01	Port 1 Pin 4
	0x02	Port 2 Pin 4
	0x03	Port 3 Pin 4
	0x04	Port 4 Pin 4
	0x05	Port 5 Pin 4
	0x06	Port 6 Pin 4
	0x07	Port 7 Pin 4
	0x08	Port 0 Pin 2
	0x09	Port 1 Pin 2
	0x0A	Port 2 Pin 2
	0x0B	Port 3 Pin 2
	0x0C	Port 4 Pin 2
	0x0D	Port 5 Pin 2
	0x0E	Port 6 Pin 2
	0x0F	Port 7 Pin 2
		Definitions of error cases
Bit 4	0	Error on a port of the IO-Link Master
	1	Error on an IO-Link device Bit 0 to 3 indicate which port the defective device is connected to.
	2	Error on IO-Link Master In this case bits 0 to 3 have no significance, since the error affects the entire IO-Link Master, as for example “with undervoltage”.

Table 19: Channel Number

7.4 ChannelProperties

The “ChannelProperties” comprise 2 bytes and are subdivided as follows:

Designation	Bit	Possible values	Description
Type	0 – 7	0x00	Used if the “Channel Number“ is “0x8000” or does not apply to any of the types defined below.
		0x01	1 Bit
		0x02	2 Bit
		0x03	4 Bit
		0x04	8 Bit
		0x05	16 Bit
		0x06	32 Bit
		0x07	64 Bit
		0x08 – 0xFF	Reserved
Accumulative	8		Not used, always 0
Maintenance	9	0x00	Diagnostics
	10	0x00	Diagnostics
Specifier	11 – 12	0x00	Not used
		0x01	Diagnostics occurred
		0x02	Diagnostics gone
		0x03	Diagnostics gone, but one other is still active
Direction	13 – 15	0x00	Manufacturer specific
		0x01	Channel used as input
		0x02	Channel used as output
		0x03	Channel used as input and output

Table 20: ChannelProperties

7.5 ChannelErrorType

Error code in hex	Description
0x0000	Unknown error
0x0001	Short-circuit
0x0002	Undervoltage
0x0003	Overvoltage
0x0004	Overload
0x0005	Temperature limit exceeded
0x0006	Line break
0x0007	Upper threshold exceeded
0x0008	Lower threshold not reached
0x0009	Error
0x001A	External error
0x001B	Sensor has incorrect configuration (IO-Link device)
0x0021	Sensor supply short-circuit
0x0037	Actuator warning
0x0038	Actuator short-circuit
0x0039	Bus/sensor supply undervoltage
0x003C	Actuator supply under voltage

Table 21: ChannelErrorType

8 Operation via the web server

8.1 General information

The IO-Link Master has an integrated interface for a web server.

You can use the web server to carry out the following tasks:

- Call up detailed information on the current status of the IO-Link Master.
- Call up information about connected IO-Link devices.
- Configure connected IO-Link devices.

Make sure that the device is correctly integrated into the network. To set up a connection with the web server, enter the IP address of the IO-Link Master into the address bar in the browser. A welcome page appears.

Use the current version of Internet Explorer and deactivate the proxy server.

8.2 Views

The web server comprises the following views:

- Welcome page
- Home
- Diagnostic process
- Device properties
- Diagnostic module
- Configuration
- Contact

Welcome page

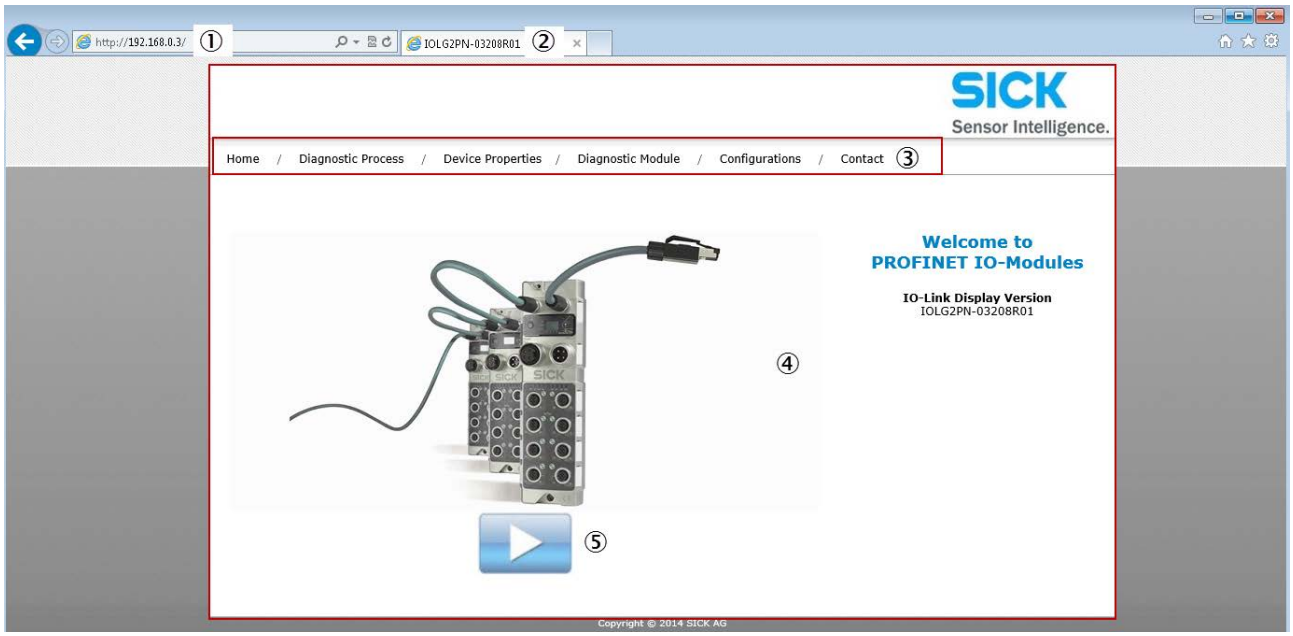


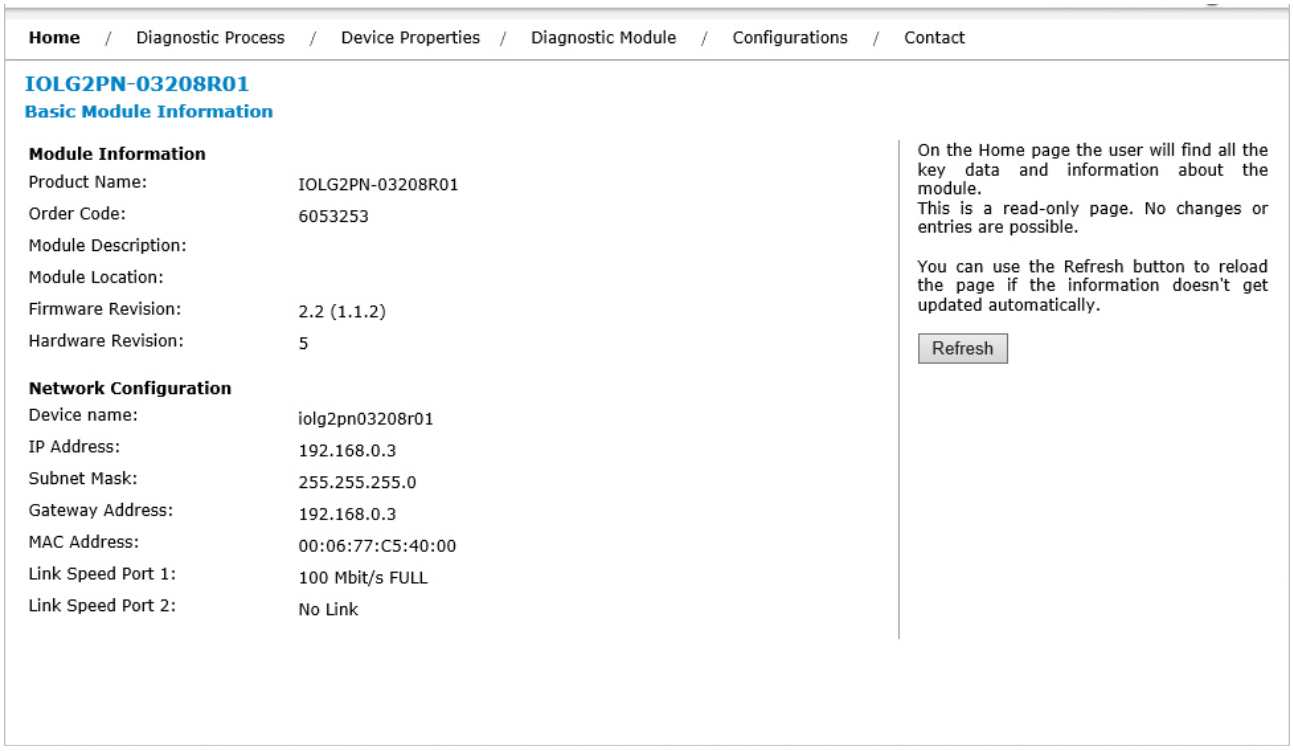
Fig. 10: Welcome page of the web server

① *IP address of the IO-Link Master in the address bar of the browser*
② *Device designation, in this case IOLG2PN-03208R01*
③ *Navigation bar for switching between the views*
④ *View, in this case "Welcome page" view*
⑤ *"Play" button*

➢ Click the "Play" button to switch to the "Home" view.

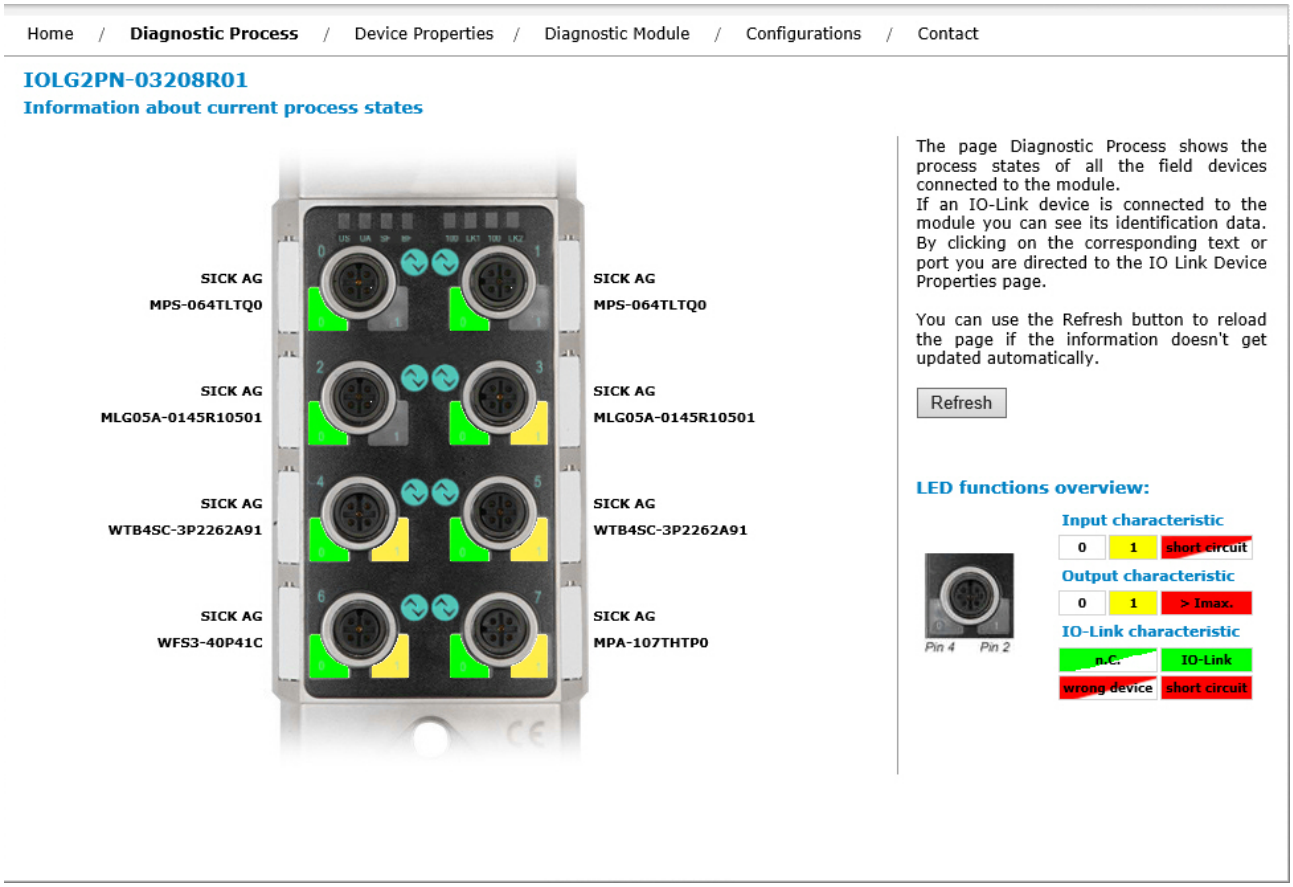
“Home” view

- Displays information about the IO-Link Master
- Displays the network activity of the IO-Link Master



“Diagnostic process” view

- Displays current process data via LEDs
- Displays the port status via LEDs
- Displays data for connected IO-Link devices



➢ To display the information and configuration for the right IO-Link device, select the corresponding port in the figure on the right-hand side.

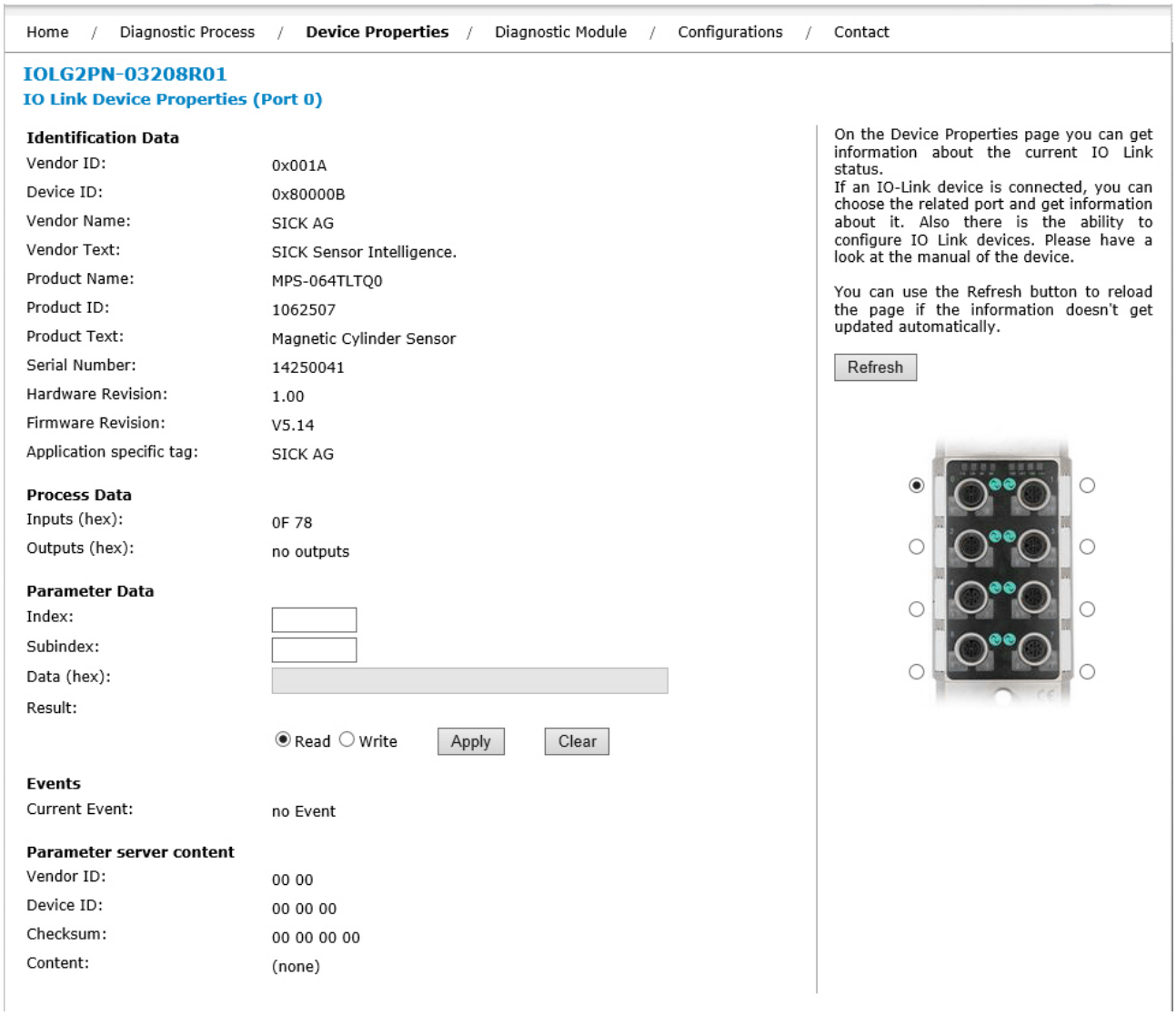
NOTE!

You cannot use the web server to configure the IO-Link Master. This requires a suitable controller with the relevant project planning software.

“Device properties” view

- Displays the process data for the relevant IO-Link device

➢ To display the information and configuration for the right IO-Link device, select the corresponding port in the figure on the right-hand side.



NOTE!

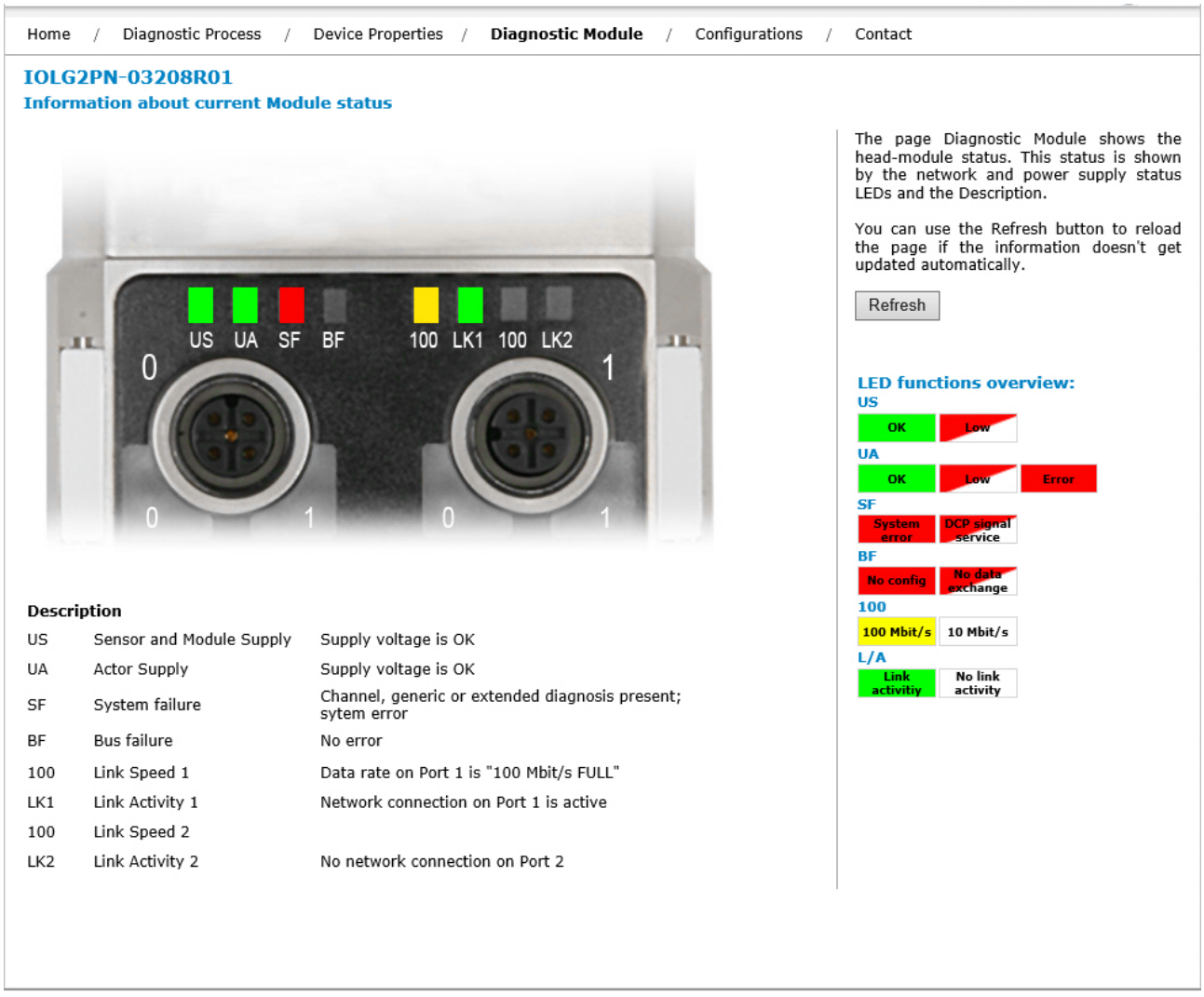
You cannot use the web server to set output data for the IO-Link device. This requires a suitable controller with the relevant project planning software.

“Device properties” view – port for the desired IO-Link device selected

- Configuration of the relevant IO-Link device
  - Parameter data: Read and write IO-Link parameter data. For the indices and subindices, please refer to the operating instructions for the relevant IO-Link device.
  - Events: Displays the current events for the IO-Link device
  - Parameter server content: Displays the content of the parameter server

“Diagnostic module” view

- Displays the current status of the IO-Link Master
- Displays the current status of the network



“Configuration” view

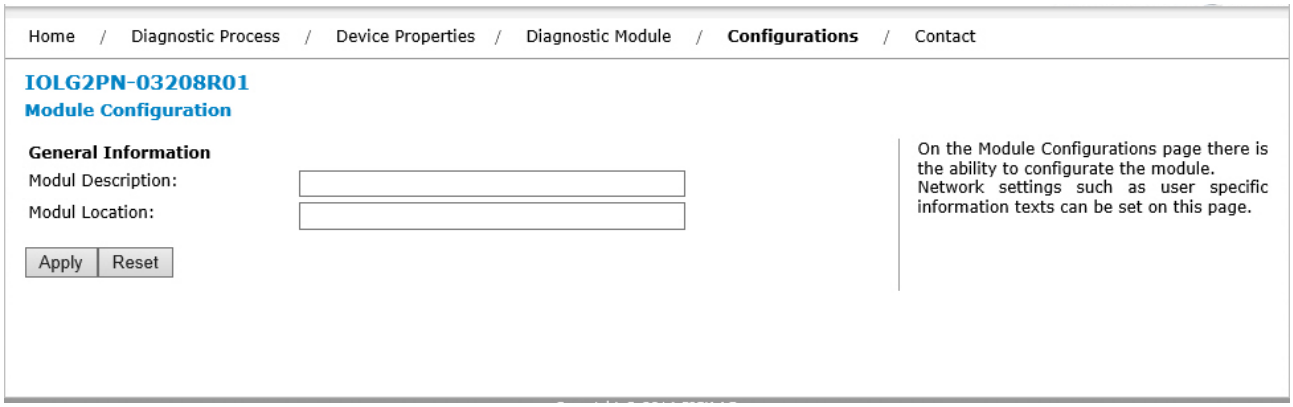
You can use this view to change the description and position for the IO-Link Master. To change the data, enter the following user name and password:

- User name: sick
- Password: IOLG2

NOTE!

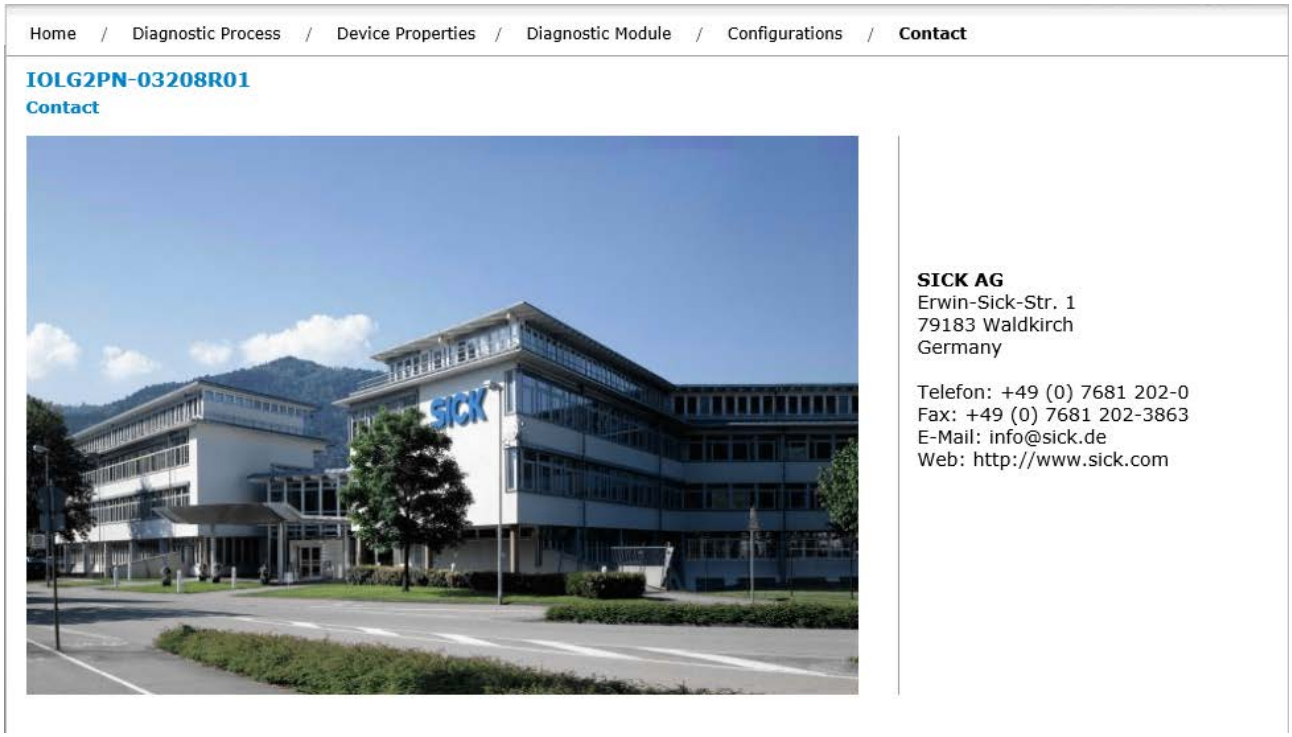
If the access with the password above is not possible, please test with the following passwords:

- IOLGP
- IOLG2
- IOLG2P
- IOLG2;



“Contact” view

- Contact information for SICK AG



9 Cleaning and maintenance

SICK devices are maintenance-free. We do recommend checking the screw and male/female connections and cleaning the device at regular intervals.

10 Disposal

Please observe the following when disposing of the device:

- Do not dispose of the device in domestic refuse.
- Dispose of the device according to the relevant country-specific regulations.

11 Technical data

NOTE!

You can download, save, and print the relevant online data sheet with technical data, dimensions, and connection diagrams for the IO-Link Master online at "www.sick.de". Enter the order number "6053253" for the IOLG2PN-03208R01 IO-Link Master on the web page.

11.1 Dimensions

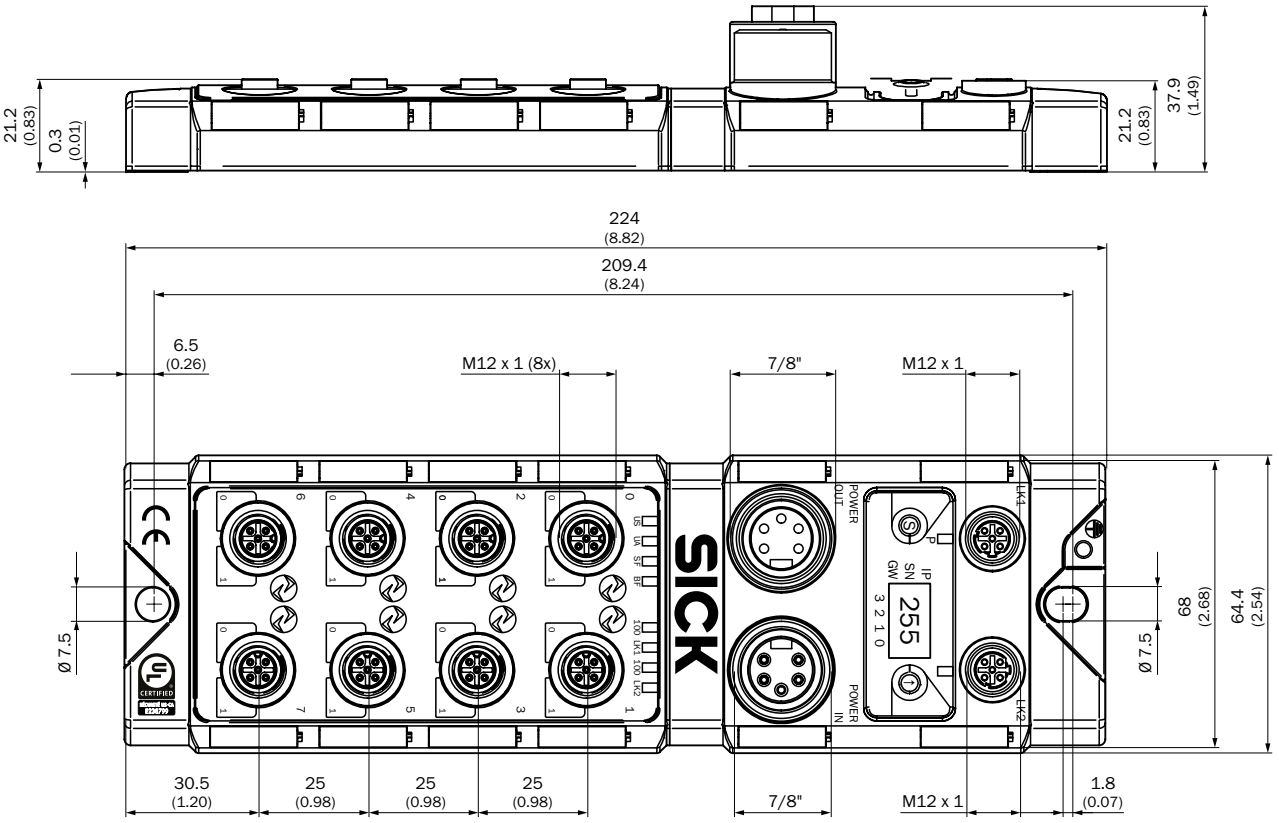


Fig. 11: Dimensions of the PROFINET IO-Link Master IOLG2PN-03208R01
Dimensions in mm (inch)

11.2 Power supply

Supply voltage	DC 18 V ... 30.2 V
Connection	7/8” male connector, 5-pin
Functional grounding	1 FE connection for M4 ground strap
Current consumption at 24 V DC	130 mA
Residual ripple	< 1%
Input ports/output ports	8 x M12 female connector, 5-pin, A-coded

Table 22: Supply

11.3 PROFINET

PROFINET port	2 x 10Base-/100Base-Tx
PROFINET port connection	2 x M12-female connector, 4-pin, D-coded
Data transmission rate	10 / 100 Mbit/s
Suitable cable types in accordance with IEEE 802.3	Screened, twisted cable pair, at least STP CAT5 or STP CAT5e
Max. cable length	100 m
Flow control	Half duplex / full duplex (IEEE 802.33x-Pause)

Table 23: PROFINET

11.4 Ambient conditions

Mark of conformity	CE
EMC	EN 61000-6-2 EN 61000-6-4
Ambient temperature range	• Operation: –5 °C ... +70 °C • Storage: –25 °C ... +70 °C
Enclosure rating (IEC 60529)	IP 67 when plugged in and screwed together
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6, EN 60068-2-64

Table 24: Ambient conditions

11.5 Structural design

Dimensions	→ See Page 45, Chapter 11.1.
Housing material	Zinc die cast, matte nickel-plated
Weight	Approx. 670 g
Mounting	2 mounting holes for M6 screws

Table 25: Structural design

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